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EARTHQUAKES: Texas rejects some injection wells as tremors continue

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Texas oil and gas regulators have turned down two permits for waste disposal wells this year under the state's new rules aimed at preventing man-made earthquakes and ordered tests at five other wells last week, amid a growing debate about the role of energy production in triggering seismic events.

A magnitude-4 earthquake struck Thursday near Venus, 30 miles southwest of Dallas. It was the largest earthquake to hit the region in recent years and one of 23 to strike within 12 miles of Venus since 2009, according to seismic researchers at Southern Methodist University. A string of more than 20 earthquakes struck near Azle, Texas, between November 2013 and January 2014.

The state Railroad Commission ordered underground tests at five wells located with a 5.6-mile radius of the Venus incident, under adopted rules in November aimed at preventing earthquakes caused by the disposal wells used in the oil and gas industry. The companies that operate the wells agreed to voluntarily close them, the commission said in a news release.

The state Railroad Commission adopted rules in November aimed at preventing earthquakes caused by the disposal wells used in the oil and gas industry. The commission "essentially denied" permits for wells proposed by ConocoPhillips in Andrews County in April and Cumming Company Inc. in Palo Pinto County in March, a spokeswoman said in an email.

The commission has approved 314 disposal wells since the regulations took effect.

"The rules are working as designed to protect the public and natural resources," commission spokeswoman Ramona Nye wrote.

Scott Anderson, a senior policy director for the Environmental Defense Fund, agreed that the rules were functioning as expected, but questioned whether the state should do more. The earthquake rules apply only to new permits, not to existing disposal wells.

"What percentage of them may have been permitted based on inadequate geologic data? What percentage may be leaking as a result?" Anderson wrote in an email.

Surveys showed there had been earthquakes within a 5.6-mile radius of the Cumming Co.'s proposed well in Palo Pinto County. In the Andrews County case, ConocoPhillips declined to provide additional subsurface maps the commission requested. A ConocoPhillips spokeswoman said the company withdrew its application for business reasons; Cumming did not return a phone call seeking comment last week.

The commission's staff delayed a permit for a third well while it asked for more information. The staff approved it after determining that the seismic event it spotted was actually caused by a refinery explosion.

Texas, Oklahoma and other oil-producing states have been under pressure -- including calls to penalize oil companies and fund more seismic monitoring -- to prevent the earthquakes that have come to be associated with shale drilling. So

many have occurred that the U.S. Geological Survey is working on new guidelines for predicting man-made earthquakes (*EnergyWire*, April 23).

Most of the earthquakes have been triggered by the injection of wastewater deep into the ground, which can cause seismic faults to slip and trigger an earthquake. Hydraulic fracturing -- the process of breaking up rocks with a mix of water and chemicals -- isn't thought to contribute directly to most of the events, but it produces large amounts of wastewater.

The Railroad Commission rules require companies to check the USGS database for historical earthquakes within 5.6 miles of a proposed disposal well. If any historical tremors are found, the commission staff can require the operator to provide more information; it can also alter or cancel the permits for wells shown to be linked to earthquakes.

The SMU team published a paper in April saying injection wells and other gas-production operations are the "most likely" cause of the Azle earthquakes (*GreenWire*, April 21).

SMU researchers say they'll investigate Thursday's earthquake near Venus and are trying to determine how much detection equipment they can send to the area. No injuries were reported, but local emergency management officials said on Twitter that two homes had foundation damage.

Venus is in Johnson County, which is among the top gas-producing counties in Texas. It's also been the site of man-made earthquakes. In 2009, SMU researchers published a peer-reviewed scientific paper linking a string of earthquakes near Cleburne, the county seat, to oil and gas waste disposal.

More recently, SMU has been monitoring tremors near Midlothian, about 8 miles from Venus, the SMU team said in a statement.

"I don't think any of us was surprised by Thursday's event," associate professor Heather DeShon said in the statement. "There have been a series of magnitude 3 and greater earthquakes in the Johnson County area. If you have movement on a fault and change the stresses, you increase the likelihood of additional earthquakes. In other words, one earthquake frequently leads to another."

DeShon and other SMU professors argue that the Venus quake shows the need for more research and data collection.

State legislators told the *Fort Worth Star-Telegram* they'll add $4.4 million for earthquake research to a supplemental budget bill, a move that could free up the funds by the middle of the summer. The budget rider would pay $2.47 million for equipment, including 22 permanent seismograph stations, and $2 million for data analysis